THE COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF LABOR AND WORKFORCE DEVELOPMENT
DIVISION OF OCCUPATIONAL SAFETY
OCCUPATIONAL HYGIENE / INDOOR AIR QUALITY PROGRAM
www.mass.gov/dos

Ventilation and Equipment Design Considerations For Fuming and Fingerprint Processing Laboratories In Law Enforcement Buildings

The Division of Occupational Safety Industrial Hygiene/Indoor Air Quality Program has received requests for information on design considerations to ensure preservation of indoor air quality in police buildings during forensic activities. As forensic technology improves, and anticipated needs of law enforcement agencies change accordingly; building areas are often converted from former photo developing laboratories or office spaces. Failure to consider ventilation needs during fuming activities can cause poor indoor air quality for all who work in the building. Failure to provide proper health and safety equipment can cause harm to those performing tasks.

Note: As a general rule, certain areas of a law enforcement buildings should always be considered for increased direct exhaust ventilation such as bathrooms, prisoner holding areas and places where chemicals are stored (such as evidence rooms) and used (such as forensic labs). Consult with DOS on your specific needs.

Typical chemicals commonly used in fuming include: **Superglue (ethyl-2-cyanoacrylate), acetone, titanium dioxide, petroleum ether, ninhydrin monohydrate, volcanic ash (carbon black) and iodine.**

DOS makes the following recommendations to be incorporated into Forensics Laboratories in Law Enforcement Buildings. It includes a list of health and safety equipment necessary to protect building personnel from exposures resulting from processing chemicals as well as those performing fuming and fingerprint processing.

Ventilation Needs:

- A **fume hood**, with adequate direct outdoor exhaust and properly sized to hold items being exposed for fingerprinting. The ventilation exhaust should be away from any building fresh air intakes.

- In general, the processing room should be under **negative pressure** in relationship to other occupied spaces to insure that chemical odors do not permeate other occupied spaces. This means there should be more exhaust air than supply air in this area.

- *Commercially made **ductless chambers** are readily available **but** require maintenance including carbon/HEPA filter replacement – be sure to provide for maintenance schedules and cost considerations. They often do not work as well as vented fume hoods and should only be used when exhausted hoods cannot be installed.*

Chemical Considerations:

- A flammable storage cabinet and appropriate shelving for other materials storage.
- Material Safety Data Sheets for all chemicals utilized should be kept on file and readily available in the event of an emergency.
- Use small containers of one ounce or less

Personal Protective Equipment (PPE):

- A hand wash station equipped with soap and towel dispensers.
- An eyewash station that meets the 2004 ANSI Z358.1 Standard (15 minute flush with a minimum 0.4 gal/minute of tempered water).
- PPE: Gloves, eye protection, protective clothing (lab coat or similar)

Additional Considerations:

- A separate sink of large enough capacity for washing of items.
- Appropriate shelving and counter space.
- A HEPA vacuum for cleaning of volcanic ash. DOS recommends having a HEPA vacuum dedicated to this area rather than "sharing" one with the firing range or other part of the building.
- All surfaces (Floors, walls and ceilings and counters etc) should be manufactured of easily cleanable, non porous materials.
- All electrical and plumbing work should be installed in accordance with current codes including GFCI outlets.

Note: It is understood that these chemicals are also used in the field, and appropriate health and safety precautions should be taken by officers involved

Additional Information:

For more information on health hazard evaluation identified by NIOSH see:

www.cdc.gov/niosh/hhe/reports/pdfs/1992-0147-2456.pdf

To Review *An Analytical Approach to Safety in the Use of Chemicals and Fingerprint Powder in Forensic Identification (July 2003 thru June 2004) Supplemental Research Studies and Compilation of Reference Materials By William C. Sampson and Karen L. Sampson* from the US Army Criminal Investigation Command:

www.cid.army.mil/Documents/Safety/Current%20Focus/Fingerprint%20Powder%20Safety%20Study.pdf